

Listing of claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. **(canceled)**
2. **(previously presented)** The array composition according to claim 52, 55 or 57, wherein at least one of said subpopulations comprises a unique optical signature.
3. **(previously presented)** The array composition according to claim 52, 55 or 57, wherein each subpopulation comprises an identifier binding ligand that will bind a decoder binding ligand for identification and elucidation of said bioactive agent.
4. **(previously presented)** The array composition according to claim 52, 55 or 57, wherein said substrate is a fiber optic bundle and said fiducial is a fiducial fiber.
5. **(previously presented)** The array composition according to claim 4 wherein said substrate is a fiber optic bundle, said array comprises at least three non-linear fiducials, and each of said fiducials is a fiducial fiber.
6. **(previously presented)** The array composition according to claim 5 wherein at least one of said fiducial fibers has a different shape from the others.
7. **(canceled)**
8. **(canceled)**
9. **(previously presented)** The array composition according to claim 52, 55 or 57, wherein said bioactive agents are nucleic acids.
10. **(previously presented)** The array composition according to claim 52, 55 or 57, wherein said bioactive agents are proteins.
11. **(previously presented)** The array composition according to claim 52, 55 or 57, further comprising a computer readable memory comprising:
 - a) computer code that receives a first data image; and

b) computer code that registers said first data image using said fiducial to generate a first registered data image.

12. **(previously presented)** The array composition according to claim 11 wherein said computer readable memory further comprises:

- a) computer code that receives a second data image;
- b) computer code that registers said second data image using said fiducial to generate a second registered data image; and
- c) computer code that compares said first and said second data image.

Claims 13-17. **(withdrawn)**

18. **(canceled)**

19. **(previously presented)** The method according to claim 60, 63 or 65, wherein said subpopulations further comprise an identifier binding ligand that will bind a decoder binding ligand for identification and elucidation of the bioactive agent.

20. **(previously presented)** The method according to claim 60, 63 or 65, wherein at least one of said subpopulations further comprise an optical signature for identification and elucidation of the bioactive agent.

21. **(previously presented)** The method according to claim 60, 63 or 65, wherein said substrate is a fiber optic bundle and said fiducial is a fiducial fiber.

22. **(previously presented)** The method according to claim 21, wherein said substrate is a fiber optic bundle, said array comprises at least three non-linear fiducials, and each of said fiducials is a fiducial fiber.

23. **(previously presented)** The method according to claim 22 wherein at least one of said fiducial fibers has a different shape from the others.

24. **(canceled)**

25. **(canceled)**

26. **(previously presented)** The method according to claim 60, 63 or 65, wherein said bioactive agents are nucleic acids.

27. **(previously presented)** The method according to claim 60, 63 or 65, wherein said bioactive agents are proteins.

Claims 28- 43. **(withdrawn)**

44. **(previously presented)** The composition according to claim 52, 55 or 57, wherein said discrete sites are wells.

45. **(previously presented)** The composition according to claim 52, 55 or 57, wherein said microspheres are randomly distributed on said substrate.

46. **(previously presented)** The method according to claim 60, 63 or 65, wherein said discrete sites are wells.

47. **(previously presented)** The method according to claim 60, 63 or 65, wherein said microspheres are randomly distributed on said substrate.

48. **(previously presented)** The method according to claim 19, wherein said identifier binding ligand is a protein.

49. **(previously presented)** The method according to claim 19, wherein identifier binding ligand is a nucleic acid.

50. **(previously presented)** The composition according to claim 3, wherein said identifier binding ligand is a protein.

51. **(previously presented)** The array composition according to claim 3, wherein identifier binding ligand is a nucleic acid.

52. **(previously presented)** An array composition comprising:

- a) a substrate with a surface comprising discrete sites;
- b) a population of microspheres comprising at least a first and a second subpopulation, wherein each subpopulation comprises a bioactive agent, wherein said microspheres are distributed on said surface; and
- c) at least one fiducial, wherein said fiducial is permanently incorporated into said substrate.

53. **(previously presented)** The array composition according to claim 52, wherein said fiducial is on the periphery of said array.

54. **(previously presented)** The array composition according to claim 53, wherein said fiducial is at a defined location of said array.

55. **(previously presented)** An array composition comprising:

- a) a substrate with a surface comprising discrete sites;
- b) a population of microspheres comprising at least a first and a second subpopulation, wherein each subpopulation comprises a bioactive agent, wherein said microspheres are distributed on said surface; and
- c) at least one fiducial, wherein said fiducial is on the periphery of said array.

56. **(previously presented)** The array composition according to claim 55, wherein said fiducial is at a defined location of said array.

57. **(previously presented)** An array composition comprising:

- a) a substrate with a surface comprising discrete sites;
- b) a population of microspheres comprising at least a first and a second subpopulation, wherein each subpopulation comprises a bioactive agent, wherein said microspheres are distributed on said surface; and
- c) at least one fiducial, wherein said fiducial is at a defined location of said array.

58. **(previously presented)** The array composition according to claim 57, wherein said fiducial is permanently incorporated into said substrate.

59. **(previously presented)** The array composition according to claim 52, 55 or 57, wherein said substrate is a fiber optic bundle.

60. **(previously presented)** A method of making an array composition comprising:

- a) forming a surface comprising individual sites on a substrate;
- b) distributing microspheres on said surface such that said individual sites contain microspheres, wherein said microspheres comprise at least a first and a second subpopulations each comprising a bioactive agent; and
- c) permanently incorporating at least one fiducial onto said surface.

61. **(previously presented)** The method according to claim 60, wherein said fiducial is on the periphery of said array.

62. **(previously presented)** The method according to claim 61, wherein said fiducial is at a defined location of said array.

63. **(previously presented)** A method of making an array composition comprising:
- a) forming a surface comprising individual sites on a substrate;
 - b) distributing microspheres on said surface such that said individual sites contain microspheres, wherein said microspheres comprise at least a first and a second subpopulations each comprising a bioactive agent; and
 - c) incorporating at least one fiducial onto said surface, wherein said fiducial is on the periphery of said array.
64. **(previously presented)** The method according to claim 63, wherein said fiducial is at a defined location of said array.
65. **(previously presented)** A method of making an array composition comprising:
- a) forming a surface comprising individual sites on a substrate;
 - b) distributing microspheres on said surface such that said individual sites contain microspheres, wherein said microspheres comprise at least a first and a second subpopulations each comprising a bioactive agent; and
 - c) incorporating at least one fiducial onto said surface, wherein said fiducial is at a defined location of said array.
66. **(previously presented)** The method according to claim 64, wherein said fiducial is permanently incorporated into said array.
67. **(previously presented)** The method according to claim 60, 63 or 65, wherein said substrate is a fiber optic bundle.